Mastertech Vehicle Communication Interface (VCI) User's Guide

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F00E900173

The Mastertech Vehicle Communication Interface User's Guide provides an overview of the tool.

Everything contained in this manual is based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

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Note
If you are reading this guide on your computer, note that the figures and illustrations are hyperlinked to the text. To view a figure, simply click on its reference.

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

VDE and CSA Certification (Europe and Canada)

This equipment complies with the requirements of VDE 0871/6.78 and CSA Class No. 3631 05,DQD No.548. Improper use or maintenance neglect may cause unacceptable radio or TV interference.

Certification Specifications

Pollution Degree: 2
Operational Altitude: 2000 m. (6,500 ft.)
Operational Humidity: 80%
Operational Temperature: 0°C to 50°C
Electrical Input: 7-32 VDC at 750mA max.

Power Supply

The Mastertech VCI base kit includes an external AC to DC power supply with 100-240 VAC 50/60 Hz input. Output is 12 volts at 1.25 amps.

Caution
These devices are intended for indoor use only.

Foreword

The Shop Foreman Pro and Mastertech Vehicle Communication Interface are designed for use by trained service personnel to diagnose and repair automotive electronic systems. Every attempt has been made to provide complete and accurate technical information based on factory service information available at the time of publication. However, the right is reserved to make changes at any time without notice.

To familiarize yourself with the Shop Foreman Pro applications and its capabilities, and how to use it, please read through the User's Guides before putting the VCI to work.

Shop Foreman Pro provides the following capabilities:

- Electronic Control Unit (ECU) Data Transfer
- Shop network communications (LAN and WLAN)
- Future expandability, including diagnostic applications

Location of Vehicle ECUs and Test Connectors

For the location of vehicle Electronic Control Units (ECUs) and Data Link Connectors (DLCs), refer to the Repair Manual and the electrical wiring diagram for the vehicle being tested.

Warranty and Repair

Warranty Information

The Mastertech Vehicle Communication Interface is warranted by Robert Bosch LLC to be free of defects in material and workmanship for two years. Cables, adapters, and accessories are warranted for a period of one year. This warranty period is from the date of sale to the original consumer. If the product is found to be defective during this period, the product can be returned to Robert Bosch repair facility and will be repaired or replaced free of charge at the sole discretion of Robert Bosch LLC. This warranty does not cover any part that has been abused, altered, used for a purpose other than that of which it was intended, or used in a manner inconsistent with instructions regarding its use. This warranty also excludes all incidental or consequential damages.

Repair Service

If you suspect that you have a problem with this product, read the operating instructions carefully to ensure that you are operating the product properly. If it is determined that a problem exists, please contact the Robert Bosch Repair Center.

North America: 800-321-4889
Canada: 905-668-2664
Japan: (045) 222-0960
Australia: +61 (2) 98905701
Europe: 49 (0) 607-8428 25

If the product needs to be returned for repair, please package the product and send it freight prepaid to the Robert Bosch Repair Center as instructed by the Technical Service representative (No C.O.D.s please).

Please enclose your telephone number, return address, and an explanation of the problem. If the product is determined to be in warranty, it will be repaired or replaced at no charge and returned freight prepaid. If determined to be non-warranty, it will be repaired for a nominal service fee.

Robert Bosch LLC
2030 Alameda Padre Serra, Suite 300
Santa Barbara, CA 93103-9903

Warnings, Cautions, Notes

In the *VCI User's Guide*:

- **Warnings** indicate there is a possibility of injury to you or other people.
- **Cautions** indicate the possibility of damage to equipment.
- **Notes** providing additional information are separated from the text but do not appear in bold.

Refer to the Repair Manual for the vehicle being tested for further Warnings, Cautions, and Notes.

Operating Precautions

Warning
When performing any checks with the engine running in an enclosed space such as a garage, be sure there is proper ventilation. Never inhale exhaust gases; they contain carbon monoxide—a colorless, odorless, extremely dangerous gas which can cause unconsciousness or death.

Warning — Set Parking Brake
To help avoid personal injury, always set the parking brake securely and block the drive wheels before performing any checks or repairs on the vehicle.

Caution
Ensure cables and adapters are firmly connected before starting to use the VCI. Always read the instructions completely before attempting a new procedure.

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Product Description

Mastertech Vehicle Communication Interface Kit Components

The Mastertech Vehicle Communication Interface (VCI) arrives in a kit which also contains a J1962 16/26 Pin DLC Cable, 120VAC/12VDC, 1A Power Supply, USB cable, cable keeper and the media containing diagnostic application software (figure 1-1). A description of the VCI hardware and software is included in the following sections.

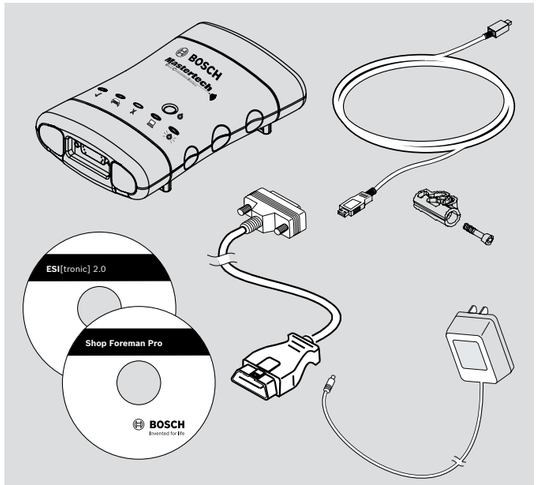


Figure 1-1. Mastertech Vehicle Communication Interface Kit

The VCI is used by professional technicians as an aid in diagnosing and repairing automotive electrical and electronic systems. The VCI is the connection between the diagnostic software applications running on the PC and a vehicle's electrical and electronic systems.

For details about the diagnostics applications that are compatible with the VCI, refer to the Bosch diagnostics website; www.boschdiagnostics.net.

VCI Connections

For the location of the connectors for DC power and vehicle communication on the VCI, see Figure 1-2.

For the location of the connectors for PC communication on the VCI, see Figure 1-3.

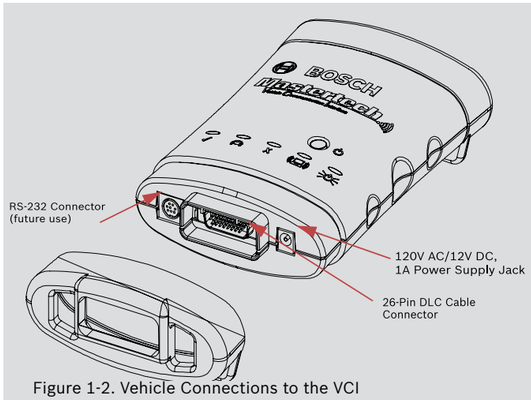


Figure 1-2. Vehicle Connections to the VCI

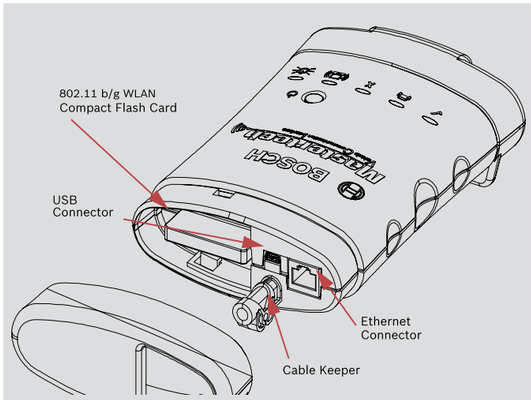


Figure 1-3. PC Connections on the VCI

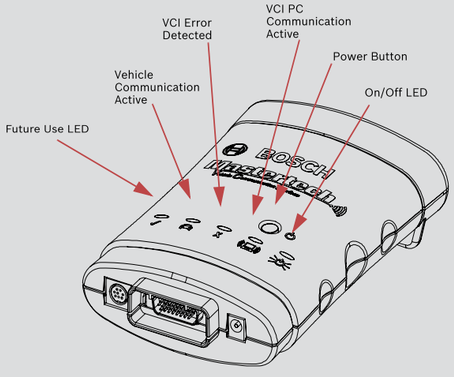


Figure 1-4. PC Standard Indicators (LEDs) and Power Button

For a description and location of the standard indicators (LEDs) and the power button, see Figure 1-3.

Host Computer Interface

The VCI communicates with a host computer using three possible interfaces between the VCI and the PC:

- Universal Serial Bus (USB),
- Local Area Network (LAN), and
- Wireless Local Area Network (WLAN).

Universal Serial Bus (USB)

Note
The USB connection takes priority over an ethernet or a WLAN connection. All configuration changes or software updates are only allowed using the USB connection.

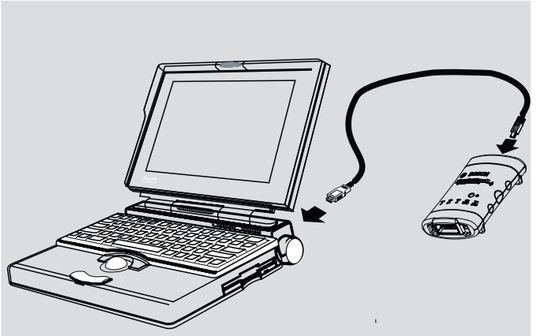


Figure 1-5. USB is the first connection

The VCI has a fixed USB configuration (static IP address) which cannot be changed. This ensures that the VCI can always be connected to a PC running diagnostic software and the VCI Manager application regardless of changes to LAN or WLAN configurations required by the local network. Refer to Using the VCI Manager application for details.

The connectors on the USB cable are slip-in connectors that do not securely lock in place. In order to keep the USB cable connected, secure it to the VCI using the supplied cable keeper. The cable keeper is attached to the VCI case with a supplied 2.5 mm hex-head screw, the USB cable is inserted into the slot, and then plugged in as shown in Figure 1-6.

Figure 1-6. Securing the USB Cable

Local Area Network (LAN)

Latch

A LAN consists of a two or more computers connected together using ethernet cables. The connectors on both ends of an ethernet cable are latched. To disconnect them you must press down on the latch while you pull the connector out.

The VCI's LAN communication is setup and configured as required for the user's local area network using a PC running the VCI Manager application. The VCI can be networked using a Direct Connection (crossover ethernet cable) or a network router (straight ethernet cable). A brief description of each of these network configurations follows.

- Direct Connect—Cross-over Ethernet Cable
- LAN with Network Router—Straight Ethernet Cable

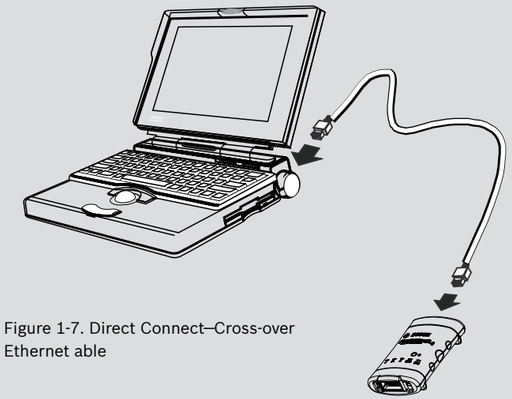


Figure 1-7. Direct Connect—Cross-over Ethernet able

Figure 1-7, above, shows a computer connected to a VCI using a cross-over ethernet cable. In this configuration the computer can communicate directly to the VCI. Most computers have only a single network interface connection so in this configuration you will only have communication to the VCI. Refer to Enable Wired Ethernet for details on configuring your VCI for communication on a wired ethernet using a cross-over cable.

Note
A cross-over ethernet cable is required for LAN Direct Connection. A cross-over cable is not provided in the Mastertech VCI kit, but can be purchased at your local computer store.

LAN with Network Router—Straight Ethernet Cable

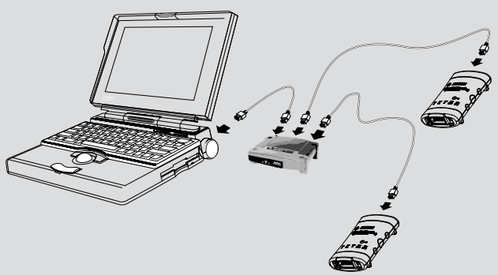


Figure 1-8. Connecting to VCIs on the Local Network through a Network Router

Many offices and shops have computers connected together using ethernet cables, network routers, and other items such as printers and modems (internet connection for email). Figure 1-8, shows one computer connected to a network router which is then connected to two VCIs. In an actual network there will typically be several computers connected into network routers allowing any of the computers to connect to and control one of the VCIs. Refer to Enable Wired Ethernet for details on configuring your VCI for communication on a wired ethernet.

Wireless Local Area Network (WLAN)

The VCI's 802.11B/G WLAN connection is setup and configured as required for the user's local wireless network using a PC running the VCI Manager application. The VCI supports both Direct Connect (ad-hoc) and Access Point wireless configurations. A brief description of each of these wireless communication configurations follows.

Direct Connect (ad-hoc) Wireless

The ad-hoc wireless option allows you to network your VCI wirelessly to a computer that has a wireless card and diagnostic software. This type of connection is also known as peer-to-peer or Direct Connect, and does not require a network server or router. An ad-hoc connection may be ideal for situations where you want to take a notebook computer into the vehicle as you work with the VCI.

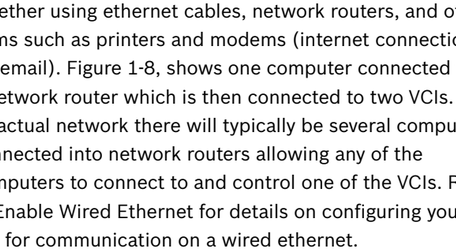


Figure 1-9. VCI Direct Connect Wireless

Note
Although an ad-hoc connection can be done from the PC's internal wireless card and the VCI, Bosch recommends that the ad-hoc connection between the PC and VCI be done using a wireless USB adapter connected to the PC.

The procedure for setting up ad-hoc wireless communications requires two steps:

1. Use VCI Manager to configure your VCI interface. Refer to Setup the VCI for Ad-Hoc Wireless Communication for details.
2. Configure your wireless communications software on your PC. Refer to Setup Your PC for Ad-Hoc Communication for details.

Access Point Wireless—Infrastructure Mode

Note
Refer to your access point manual for network configuration details and suggested operating distances.

The access point wireless option allows you to connect your VCI to a WLAN. Depending on the configuration of your LAN, the communication through an access point can allow you to access multiple VCIs from multiple PCs. You must have an 802.11B/G Wireless Access Point connected to your network within operating range of your work area. Refer to Setup your VCI for Access Point Wireless Communication (WLAN) for details.

Note
If you have any set up and connectivity issues with your access point wireless configuration, please work with your local IT to get it resolved.

Figure 1-5. USB is the first connection

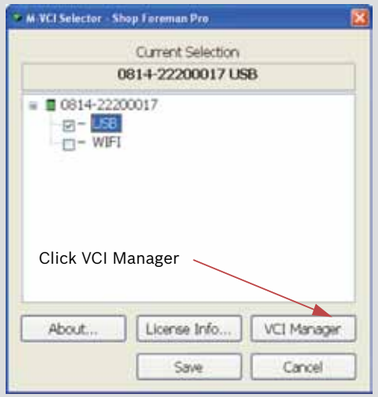
VCI Manager Application

The VCI Manager application which is part of the diagnostics application software is used to configure PC to VCI interfaces, update VCI software, and test the VCI interfaces.

To start the VCI Manager application, launch the appropriate diagnostics software application. This is either Shop Foreman Pro or **ESI**[tronic] 2.0.

Note
Clicking the Connect button in VCI Manager application establishes a connection to the VCI hardware via USB for configuring network connectivity (wired/wireless) and for updating the VCI software. Once VCI Manager is closed, the connection to the VCI hardware is no longer enabled. If VCI Manager is reopened, you must use the Connect button to re-establish the connection to the VCI hardware for configuration or software update purposes..

From the M-VCI Selector screen select VCI Manager to launch the VCI Manager application.



The VCI Manager application provides the following functions:

Note
If your VCI is connected via USB, the functions on all tabs are available; if your VCI is not connected via USB, the functions on the Network Setup and VCI Update tabs are not available.

- VCI Explorer - Connect/Disconnect, Interface Details, Product Help.
- Properties - Interface configuration info.
- VCI Update - Software Updates Availability and Initialization.

- Network Setup - Wired Ethernet, Wireless network setup.
- Help - Software Installation Details, Manager Help file, Print, Shop Foreman Pro software.

The VCI works with the diagnostic application software for testing specific vehicles and systems. Specific operating instructions are provided within respective diagnostic application software.

- The diagnostic software applications provide the user interface for communication between the VCI and the vehicle diagnostic system.
- The Vehicle System application programs are upgraded periodically to provide ongoing support for new vehicle model years, systems, and functions.
- The Vehicle System application support manuals are available on the Bosch web site; **www.boschdiagnostics.com.**

Mastertech Vehicle Communication Interface Features

Data Link Connector And Cable

Note
The DLC cable supplied with your VCI is keyed such that it will only connect to the VCI. It will not connect to a Mastertech MTS 3100 or Tech 2 and conversely, Mastertech MTS 3100 or Tech 2 cables will not connect to the VCI..

Vehicle diagnostic information is passed between the PC and the vehicle through the J1962 16/26-pin DLC cable that is connected to the VCI.

Power Source

The VCI is intended to be powered from the vehicle battery.

The VCI may also be powered using the 120VAC/12VDC, 1A Power Supply when located near a suitable wall socket. See Figure 1-11. Typically you use the 120VAC/12VDC, 1A Power Supply during bench operations when you are configuring the VCI communications, updating software, and during testing of the VCI.

Figure 1-11. 120VAC/12VDC, 1 A Power Supply

Battery Operation

Four AAA Batteries are required to power the VCI during brief power interruption.

The VCI will not operate solely on the batteries, the VCI must be connected to the vehicle's 12-volt power supply during testing or the 120VAC/12VDC, 1A Power Supply during bench operations such as setting the VCI configuration options or updating software.

See Chapter 4 for battery replacement instructions.

LEDs

Five Light Emitting Diodes (LEDs), one red and four green, are located on the front of the VCI as shown in Figure 1-12. One LED is reserved for future Shop Foreman Pro software use.

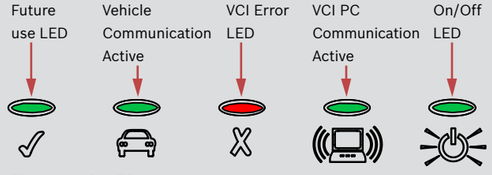


Figure 1-12. LEDs

TABLE 1-1. Mastertech VCI Specifications

Item	Characteristic
Size	16.7 x 11.4 x 3.8 cm (6.6 x 4.5 x 1.5 inches)
Weight	0.454 kg (1 lb.)
Power	3.0 Watts @ 12 Vdc
Input Voltage	7 to 32 Vdc (protected against reverse polarity)
LED Display	5 LEDs – Software controlled on-board (1 red; 4 green)
Power Sources	12-24 Volt vehicle power External 120VAC/12VDC, 1A Power Supply AAA batteries for brief power interruptions
Operating Temp.	0 °C TO 50 °C (32 °F TO 122 °F)
Storage Temp.	-20 °C TO 70 °C (-4 °F TO 158 °F)

Getting Started

Using the VCI Manager Application

Identifying Your VCI

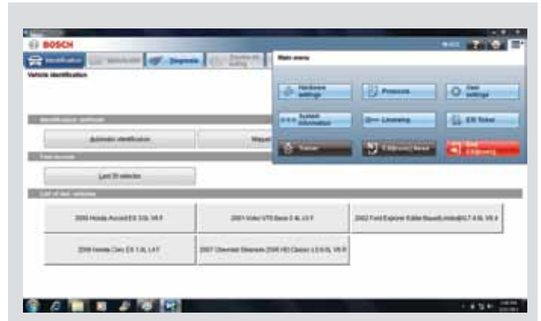
The Mastertech VCI assembly label is located on the back of the unit. As shown in the illustration at the right, the assembly identification number has two parts: a manufacturing code for traceability and a unique serial number (22000061, in this example). The 8-digit serial number is used to identify the VCI in the software.

Starting the VCI Manager Application

Use the following steps to communicate to your VCI with the VCI Manager application:

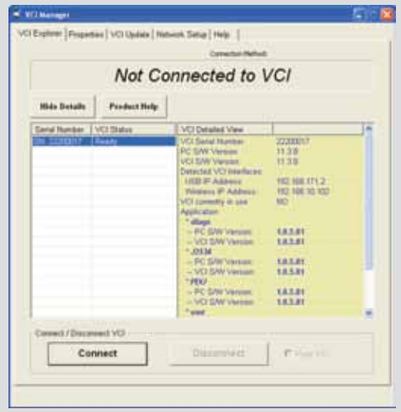
1. Apply power to the VCI by connecting the 120VAC/12VDC, 1A Power Supply. You should see the POST sequence described in Power on Self Test.
2. Connect the USB Cable to the VCI and to your PC. In order to keep the USB cable connected, you can secure it to the VCI using the supplied cable keeper.

3. Start **ESI**[tronic] 2.0 software by double-clicking on the **ESI**[tronic] 2.0 software application icon.
4. Select hardware settings... from the main menu.



5. From hardware settings I... screen select VCI Manager to launch the VCI Manager application.

6. In the VCI Manager application, VCI Explorer tab, select the VCI to interface with in the Detected VCIs window.
   Hold your cursor over the VCI icon to see a popup with the IP address and the configured connections or click on Show Details to see the detail view of the selected VCI.



Click on Connect, in either view, to connect to the VCI. The VCI is displayed with a green check mark on your display indicating that your VCI Manager application is in control of that VCI. Once you have connected to a VCI, another VCI Manager application on another PC will still detect your VCI but it will be displayed with a red “no” symbol indicating that it is not available. A VCI can only be connected to a single PC at a time.

Note
If your VCI is connected via USB, the functions on all tabs are available; if your VCI is not connected via USB, the functions on the Network Setup and VCI Update tabs are not available.

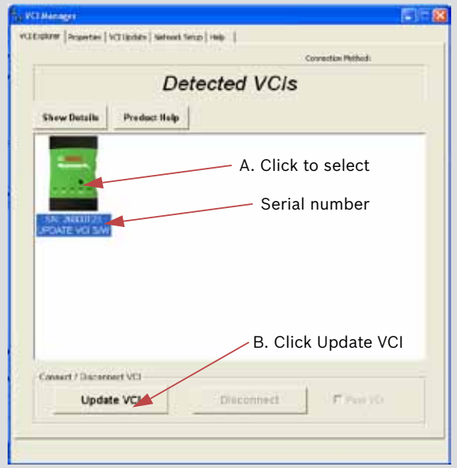
The VCI Detailed View window shows the PC S/W Version information for the VCI Manager application and the VCI S/W Version for the VCI Tester Software as well as available interfaces and IP addresses, as shown in the illustration above.

- ▶ If your VCI Manager application is more recent than the VCI Tester Software, you will need to update your VCI Tester Software, see Update VCI Tester Software.
- ▶ If your VCI Tester Software is more recent than your VCI Manager application, you will need to update your Shop Foreman Pro software. You can download the latest Shop Foreman Pro software version from the Bosch Diagnostics website, www.boschdiagnostics.com.

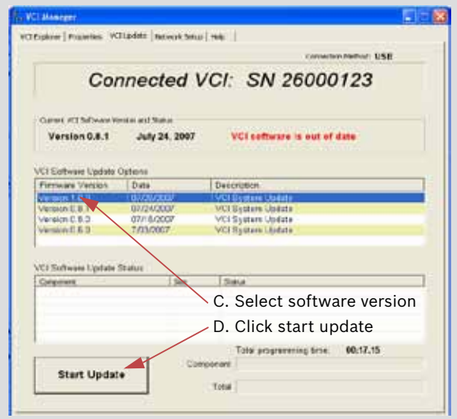
Update VCI Tester Software

After you install a new Diagnostic application software version, your VCI Manager application may be more recent than your VCI Tester Software version. You will need to connect each VCI that you have via the USB cable to the PC with the new software and update the VCI Tester Software.

1. Start the VCI Manager application, refer to Starting the VCI Manager application.
2. The VCI will appear on the VCI Explorer tab, as shown below.



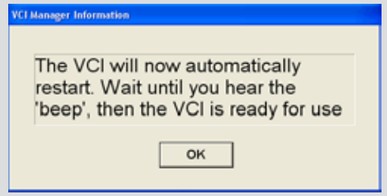
A. Select the VCI.
B. Click the “Update VCI” button.



C. Select the latest version of the VCI Tester Software.
D. Click Start Update.
   Do not unplug the VCI from the PC or remove power from the VCI during the update process.

Note
The update process may take up to 30 minutes to complete per VCI before starting the update process, make sure you have enough time.

3. When you see the message shown at the right, click OK.
   The VCI Manager application switches automatically to the VCI Explorer tab and your VCI will appear when it has finished the restart and Power On Self Test (POST).


VCI Manager Information
The VCI will now automatically restart. Wait until you hear the 'beep', then the VCI is ready for use
OK

Note
After updating, the VCI restart process will take a few minutes to complete the boot process as new files are being written to the SD card.

VCI Network Communications Setup Functions

The Network Setup tab in the VCI Manager application is used to change the VCI connection interfaces, wireless access or security settings, or to clear any previous network settings.

Note
Do not use a USB hub to connect multiple VCIs to a PC. The VCI has a static USB address and address conflicts will occur.

Note
You can not change the settings for the USB interface of the VCI. They are set at the factory with a static IP address. The PC must also be set to static IP and have the correct IP configuration.

You must be connected to the VCI via USB to access the setting on the Network Setup tab. If you are not connected via USB you will see the following message and the entire tab will be grayed out.

Note
After updating, the VCI restart process will take a few minutes to complete the boot process as new files are being written to the SD card.

Clear Network Settings

Selecting the Clear Network Settings button will reconfigure your VCI to the communications settings it had when it left the factory. Only the USB interface will be enabled. Any software upgrades that have been installed to the VCI will still be installed. When the VCI reset is finished the VCI Manager application will display the VCI Explorer tab.

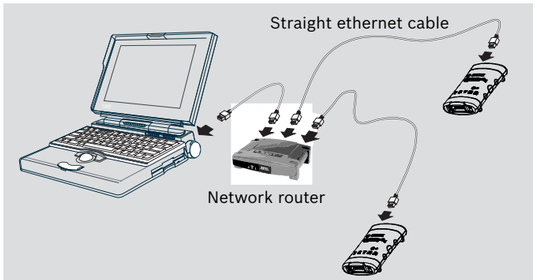
Enable Wired Ethernet

The following procedures show some examples of how to configure your VCI for wired ethernet communication. Your VCI will need an internet protocol address (IP Address) which is a unique address assigned to each computer (or other device) connected within a network.

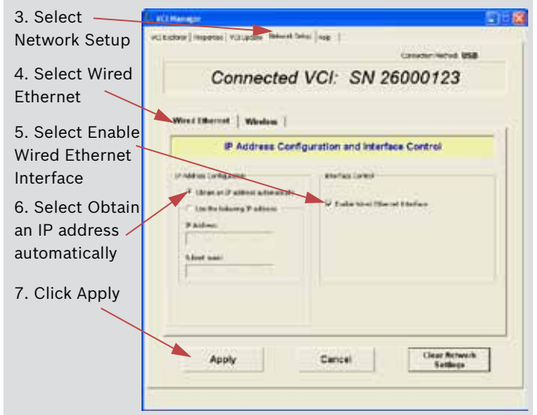
Things you will need to know:

- If you are connecting your VCI to a large network with routers, switches, and other computers, you may have a dynamic host configuration protocol (DHCP) server which will automatically assign an IP Address and Subnet Mask to your VCI each time you connect it to the network. Refer to Setup your VCI for DHCP LAN Wired Ethernet Communication–Straight Ethernet Cable.
- If you are connecting your VCI to a smaller network where each computer has a specific IP address, you will need to assign an unused IP Address and the Subnet Mask to your VCI. Refer to Setup your VCI for Static IP Address LAN Wired Ethernet Communication.
- If you are connecting your VCI to your computer using a cross-over ethernet cable, you can choose any two IP addresses which are different only in the last group of digits. Refer to Setup your VCI for Static IP Address LAN Wired Ethernet Communication.

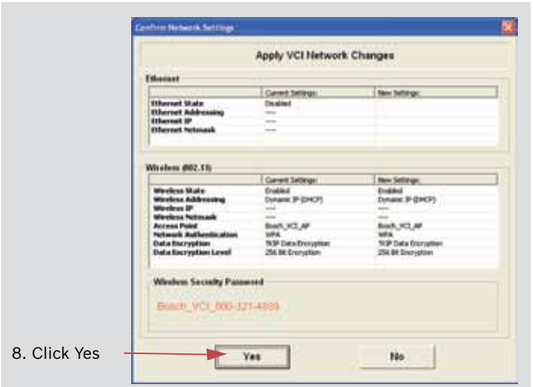
Setup your VCI for DHCP LAN Wired Ethernet Communication–Straight Ethernet Cable



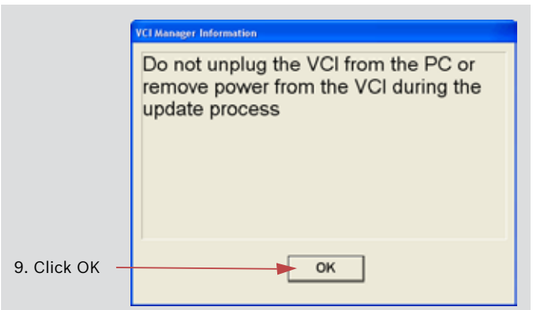
1. Start the VCI Manager application. Refer to Starting the VCI Manager application.
2. Select and Connect to your VCI in the VCI Manager application, VCI Explorer tab.
3. Select the Network Setup tab.
4. Select the Wired Ethernet tab.


3. Select Network Setup
4. Select Wired Ethernet
5. Select Enable Wired Ethernet Interface
6. Select Obtain an IP address automatically
7. Click Apply
Connected VCI: SN 26000123
IP Address Configuration and Interface Control
Apply
Cancel

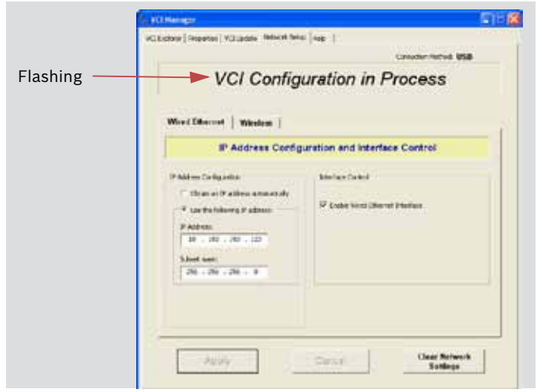
5. Select the Enable Wired Ethernet Interface check box in the Interface Control box to enable the interface. Once you enable the interface, the IP Address Configuration box and the Apply and Cancel buttons become active. You can start over anytime before you select Apply by selecting Cancel so that all your stored changes are discarded.
6. Select Obtain an IP address automatically if your LAN automatically assigns IP addresses.
7. Click Apply to reconfigure your VCI. You will see the screen at the right to check your communication changes.
8. Click Yes to continue, or No to get back to the Network Setup tab to make any changes.



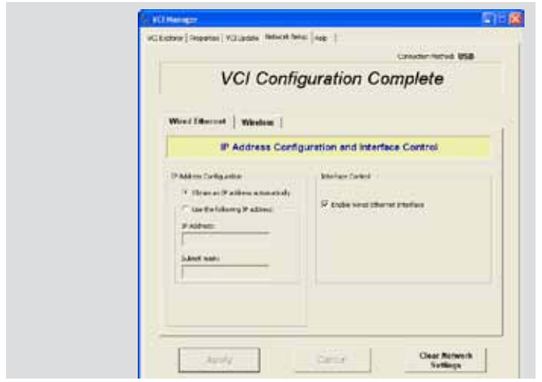
9. Click OK.
If you unplug the VCI from the PC or remove power from the VCI during the update process, you will have to recover the VCI. Refer to Recover VCI Tester Software.


VCI Manager Information
Do not unplug the VCI from the PC or remove power from the VCI during the update process
9. Click OK
OK

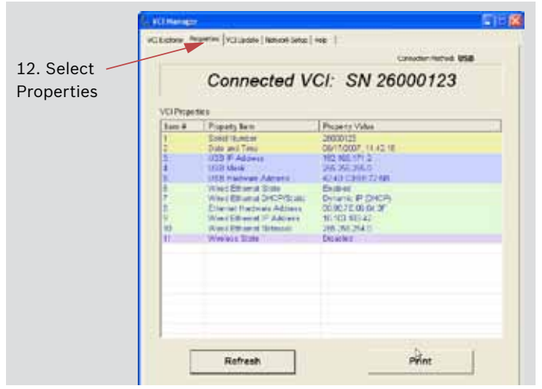
10. VCI Configuration in Process will flash during the update process.



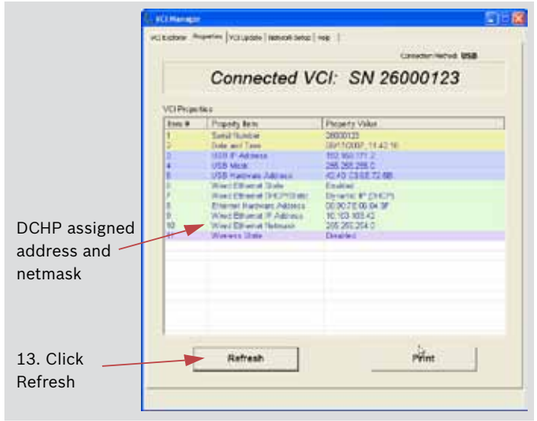
11. VCI Configuration Complete will be displayed briefly when the update process is finished.



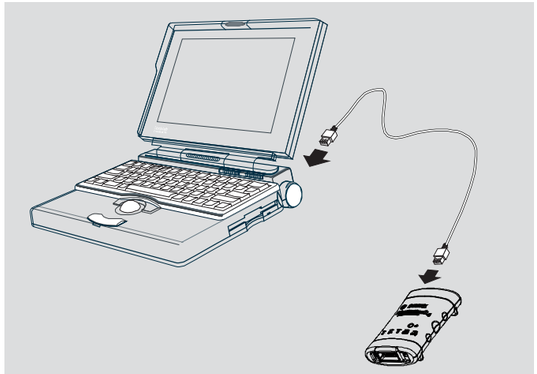
12. Choose the Properties tab to verify that the VCI is configured correctly.



13.Record or print your settings as they are displayed on the Properties tab for future reference. After you have connected your VCI to the network, the DHCP server will assign an IP Address and Netmask. Click Refresh on the Properties tab to see the assigned IP address.

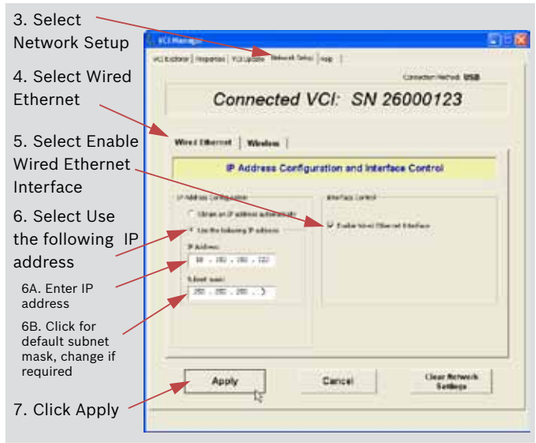


Setup your VCI for Static IP Address LAN Wired Ethernet Communication

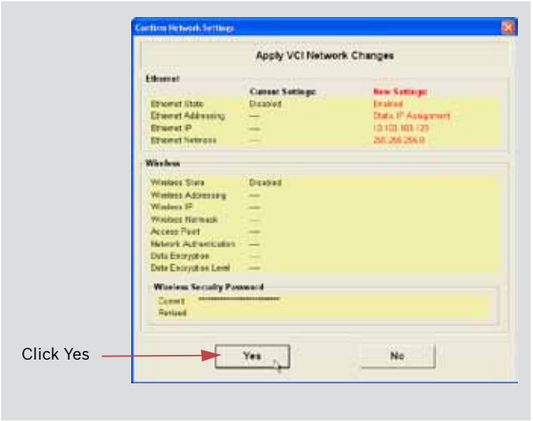


Note
If you connect your PC and your VCI directly using a cross-over ethernet cable, you can enter any static IP address and subnet mask for the VCI that is identical to your PC's IP address except for the final IP address group. For example: If you PC's IP address is 10.190.171.4, the VCI must be set up with an IP address of 10.190.171."x" where "x" can be any number except 4. The subnet mask must be the same on both the PC and the VCI.

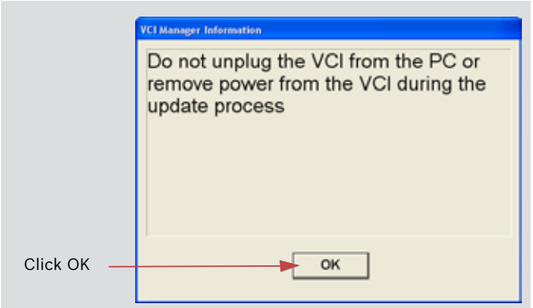
1. Start the VCI Manager application. Refer to Starting the VCI Manager application.
2. Select and Connect to your VCI in the VCI Manager application, VCI Explorer tab.
3. Select the Network Setup tab.
4. Select the Wired Ethernet tab.


3. Select Network Setup
4. Select Wired Ethernet
5. Select Enable Wired Ethernet Interface
6. Select Use the following IP address
6A. Enter IP address
6B. Click for default subnet mask, change if required
7. Click Apply
Connected VCI: SN 26000123
IP Address Configuration and Interface Control
Apply
Cancel

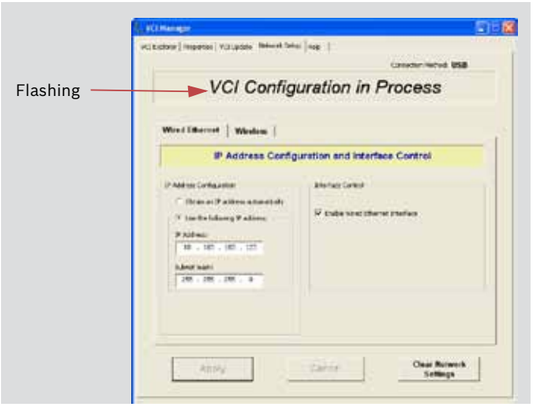
5. Select the Enable Wired Ethernet Interface check box in the Interface Control box to enable the interface. Once you enable the interface, the IP Address Configuration box and the Apply and Cancel buttons become active. You can start over anytime before you select Apply by selecting Cancel so that all your stored changes are discarded.
6. Select Use the following IP address:
   A. Enter the IP Address that you have determined will be unique to your network.
   B. The default Subnet mask will usually work. Change it if required for your network.
7. Click Apply to reconfigure your VCI.
   You will see the screen at the right to check your communication changes.
8. Click Yes to continue, or No to get back to the Network Setup tab to make any changes.



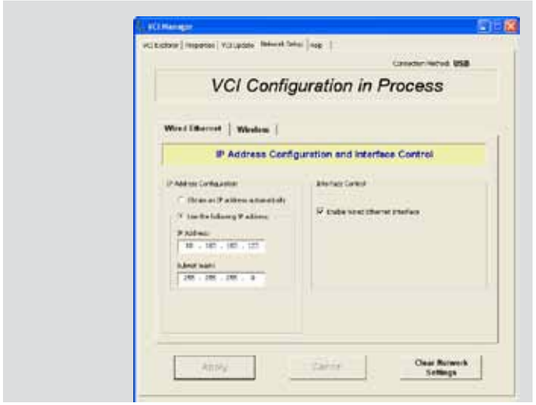
9. Click OK.
   If you unplug the VCI from the PC or remove power from the VCI during the update process, you will have to recover the VCI. Refer to Recover VCI Tester Software.


Click OK
VCI Manager Information
Do not unplug the VCI from the PC or remove power from the VCI during the update process
OK

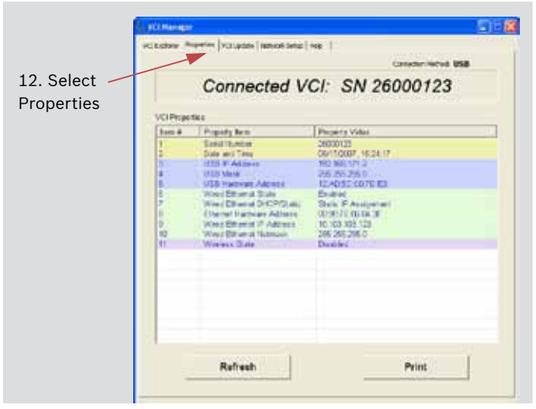
10.VCI Configuration in Process will flash during the update process.



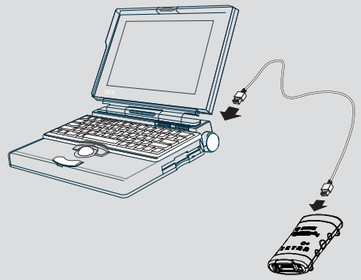
11. VCI Configuration Complete will be displayed briefly when the update process is finished.



12.Choose the Properties tab to verify that the VCI is configured correctly.



Setup Your PC for Direct Connection Wired Ethernet Communication



Note
The following example will configure your Toughbook PC for a direct connection using a cross-over ethernet cable. This procedure is not required if you are connecting your VCI to a network router that your PC is already communicating with.

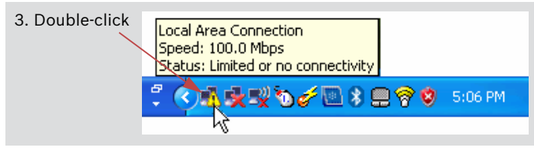
Using the information, shown below, your PC can now be connected using a cross-over ethernet cable to the VCI to create a LAN of two devices.

Wired Ethernet State	Enabled
Wired Ethernet DHCP/Static	Static IP Assignment
Ethernet Hardware Address	00:90:7E:06:04:3F
Wired Ethernet IP Address	10.103.103.123
Wired Ethernet Netmask	255.255.255.0

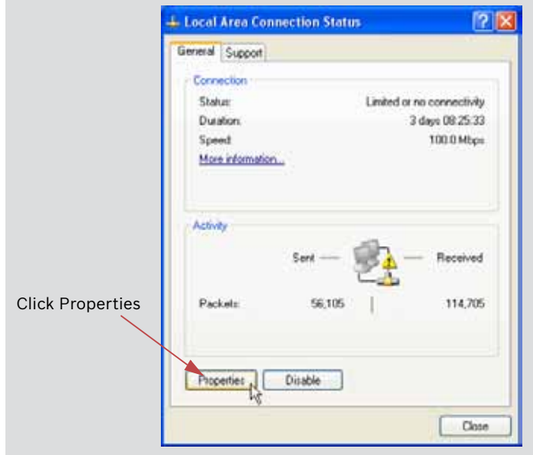
This process, though essentially the same for any laptop, will differ somewhat in the details depending on the specific network interface (NIC) card installed in your computer. The process described in the following procedure is specific to the Bosch-recommended Panasonic ToughBook, however the process should be similar enough for any notebook PC that has ethernet capability.

1. Using a cross-over ethernet cable, connect your VCI and your laptop.

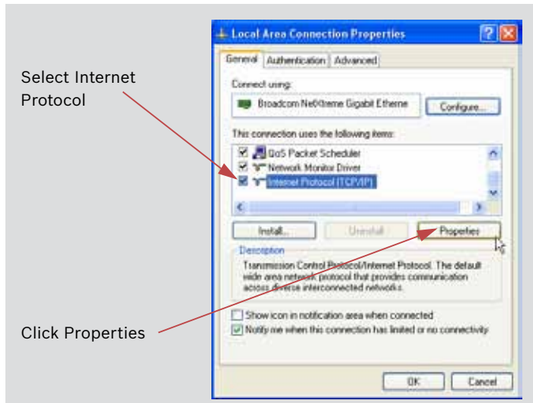
2. Power on both your VCI and your laptop.
   After both have booted, the NIC card on the laptop will see that a network ethernet cable is connected and start requesting an IP address. (This assumes that the NIC card is configured for DHCP service from an IP network.) An icon in the Windows Task Bar will display two tiny little computers with a message passing from one to the other. If you place your cursor over this icon you will see the message “Acquiring network address.” Eventually, you should see the message “Limited or no connectivity” as shown below.



3. From the Windows Task Bar, double-click the Local Area Connection icon.

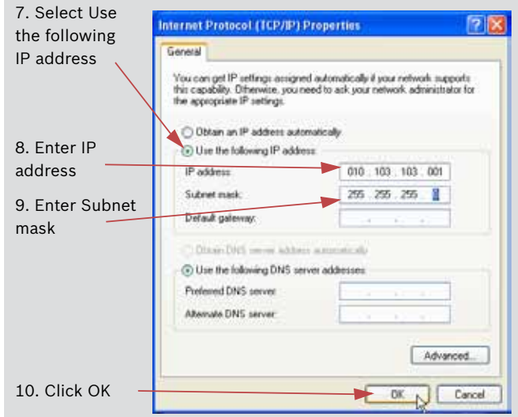


4. Click the Properties button



5. Select Internet Protocol [TCP/IP].

6. Then, click Properties.


7. Select Use the following IP address
8. Enter IP address
9. Enter Subnet mask
10. Click OK
Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 010 . 103 . 103 . 001
Subnet mask: 255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

7. Select Use the following IP address:

8. Enter the IP address. The IP address on your laptop must be the same as the IP address on the VCI except for the last group. In the above example, the VCI uses 123 for the last group while the laptop is using 001.

Note
An important thing to remember when assigning IP addresses is that they must all be unique. As long you are networking only your laptop and your VCI, you can pick any two numbers as described above. However, if your laptop has a second ethernet connector or you plan on connecting to a network using a USB-to-ethernet adapter, then you must consider the IP addresses on the entire network to avoid addressing conflicts.

9. Enter the Subnet mask. The subnet mask on your laptop must be the same as the subnet mask on the VCI.

10. Click OK. Then close the remaining connection windows.

Note
You must have a cross-over ethernet cable in order for direct connect to work. A straight through ethernet cable can be used if your PC supports switching of the Tx and Rx lines.

Setup the VCI for Ad-Hoc Wireless Communication

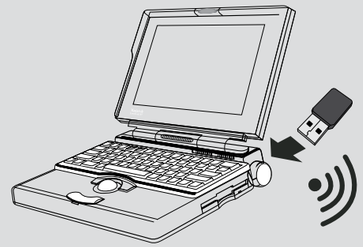


Figure 2-6. VCI Ad-Hoc Wireless

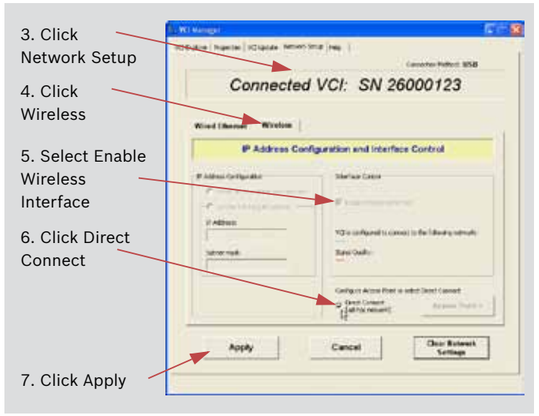
The following procedure shows how to configure your VCI for ad-hoc wireless communication. Using ad-hoc wireless communication requires that your PC has an 802.11b/g Wireless card or is connected to a wireless N USB adapter. Before modifying the VCI communications interface, contact your IT Administrator. If you wish to setup an access point wireless connection refer to Setup your VCI for Access Point Wireless Communication (WLAN).

After you set your VCI ad-hoc wireless configuration, you will need to setup your PC to communicate to the VCI. This will be explained for the PC in Setup Your PC for Ad-Hoc Communication.

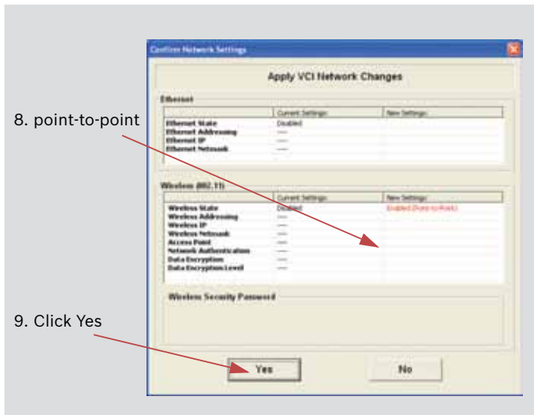
1. Start the VCI Manager application, refer to Starting the VCI Manager application.

2. Select your VCI by comparing the serial number on the back to the serial number displayed on the screen, then click **Connect**. A green check mark appears over the VCI icon indicating that a connection has been established.

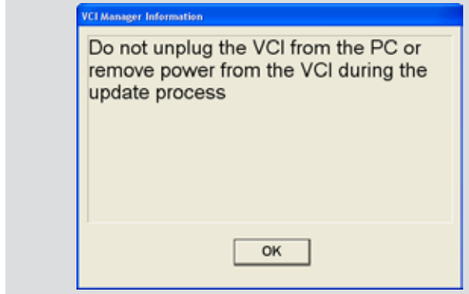
3. Click the **Network Setup** tab.



4. Click the **Wireless** sub-tab.
5. In the **Interface Control** section on the right, click the **Enable Wireless Interface** check box.
6. Near the bottom of the window, click the **Direct Connect [ad-hoc network]** check box.
7. Click the **Apply** button.
   The **Apply VCI Network Changes** window appears, displaying your new settings.
8. In the Wireless section, next to Access Point, the New Settings column should display point-to-point.



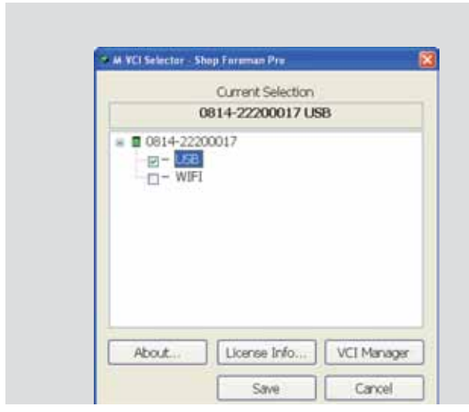
9. Click the **Yes** button to accept your changes.
10. When the VCI Manager Information dialog appears, click **OK**.



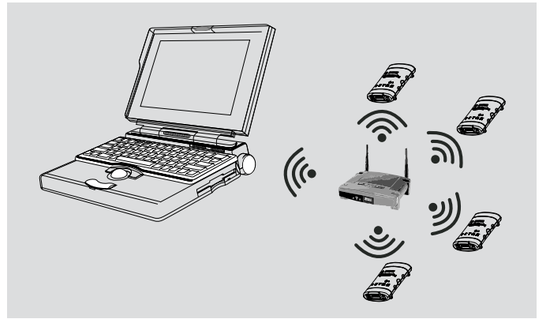
The VCI Configuration in Progress message will flash in the status window. When configuration is complete, VCI Configuration Complete will be displayed briefly, then the Connected VCI message displays showing the serial number of your VCI.

Close the VCI Manager application by clicking the red “x” in the upper right of the window, but leave the Mastertech VCI Setup dialog open for now.

You will see that a wireless entry has been created, with an IP Address still listed as unknown. The VCI is now configured, though there is still no connection with the PC. Continue with the procedure, Setup Your PC for Ad-Hoc Communication.



Setup your VCI for Access Point Wireless Communication (WLAN)

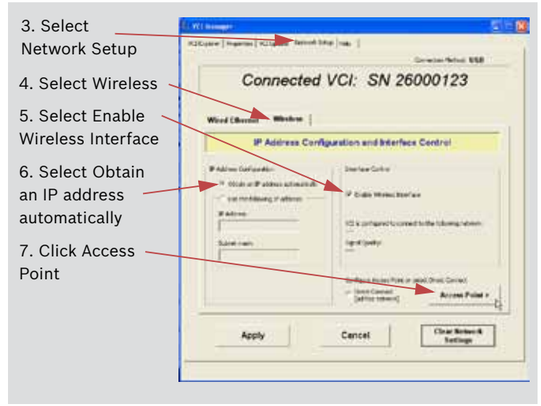


The following procedure shows how to configure your VCI for wireless communication through an access point. You must have an 802.11B/G Wireless Access Point supporting multicast connected to your network close to your work area. Before modifying the VCI communications interface, contact your IT Administrator. If you wish to setup an ad-hoc wireless connection refer to Setup the VCI for Ad-Hoc Wireless Communication.

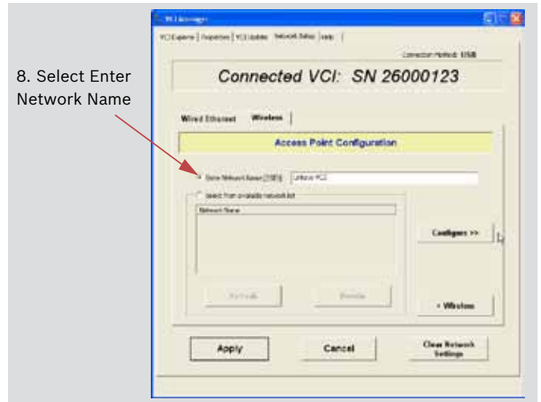
Things you will need to know for Access Point wireless configuration:

- Does your LAN automatically assign IP addresses? If not, you will need an IP Address and Subnet Mask to assign to your VCI.
- Wireless communication access point SSID (network name)
- Required network authentication is WPA–Personal, Open, or Shared
- Required data encryption is TKIP or WE (64-bit or 128-bit)
- Wireless security password (encryption key)

1. Start the VCI Manager application, refer to Starting the VCI Manager application.
2. Select and Connect to your VCI in the VCI Manager application, VCI Explorer tab.
3. Select the Network Setup tab.
4. Select the Wireless tab.



5. Select the Enable Wireless Interface check box in the Interface Control box to enable the interface. Once you enable the interface, you can select Direct Connect (ad-hoc) or Access Point. If you wish to setup an ad-hoc connection refer to Setup the VCI for Ad-Hoc Wireless Communication. If you are setting up an Access Point connection, continue with this procedure.
6. Select Obtain an IP address automatically if your LAN automatically assigns IP addresses. Otherwise enter the assigned IP Address and Subnet mask.
7. Select Access Point to begin wireless access point configuration.
8. **If you are not within range of the access point you will use:** Select the “Enter Network Name [SSID]:” radio button and type the network name.

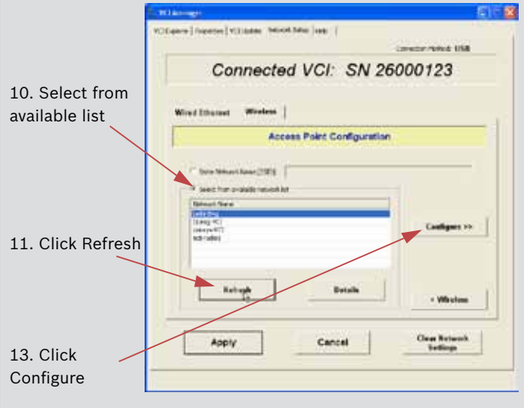


9. Ensure your PC wireless interface is ON.

10. **If you are within range of your wireless access point:** Select the “Select from available network list” radio button.

11. Click Refresh to cause the VCI to search for wireless network signals. The detected networks are displayed in the Network Name box.

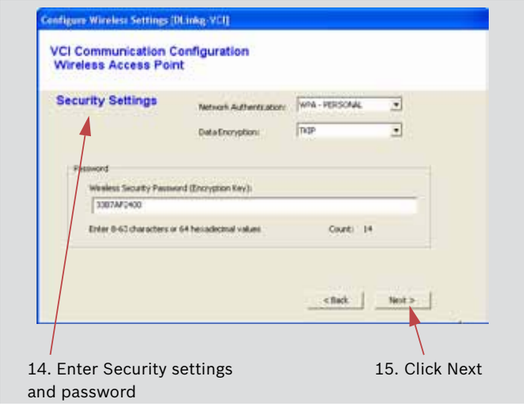
12. Select a network from the list.



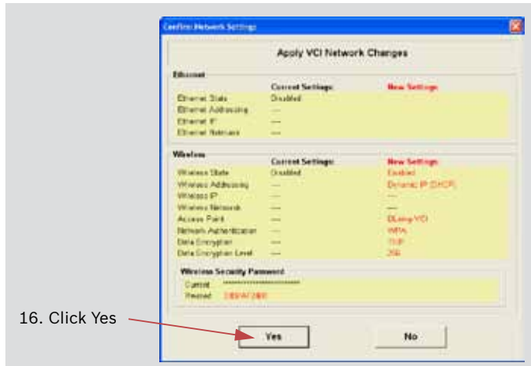
13. Click Configure.

14. Enter the security settings and password that are required by your network.

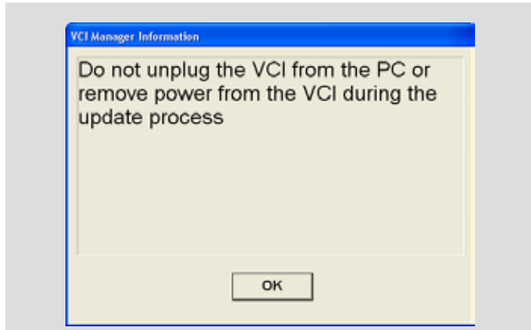
15. Click Next>.



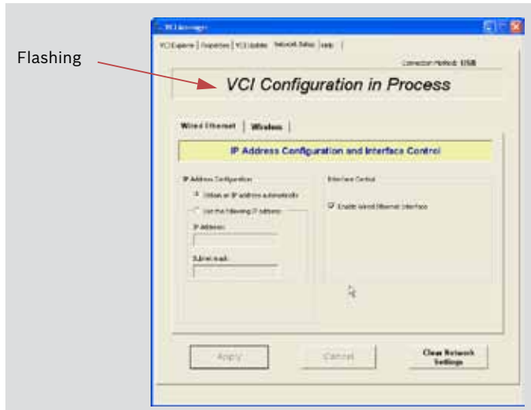
16. Click Yes to reconfigure your VCI, or if you want to start over select No.



17. Click OK. If you unplug the VCI from the PC or remove power from the VCI during the update process, you may have to recover the VCI. Refer to Recover VCI Tester Software.

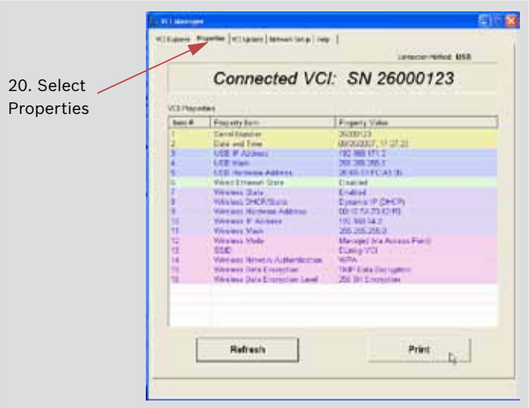


18. VCI Configuration in Process will flash during the update process.



19. VCI Configuration Complete will be displayed briefly when the update process is finished.

20. Select the Properties tab to verify that the VCI is configured correctly.



21. Record or print your settings as they are displayed on the Properties tab for future reference.

Setup Your PC for Ad-Hoc Communication

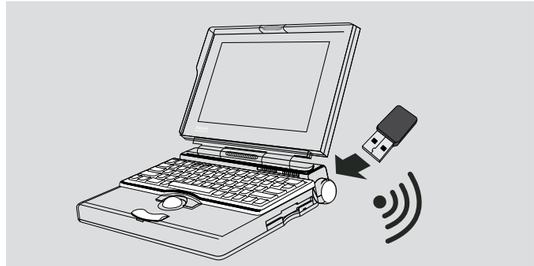
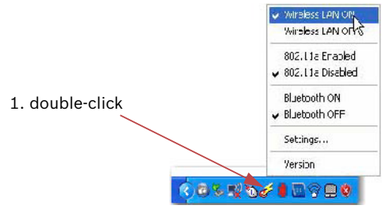


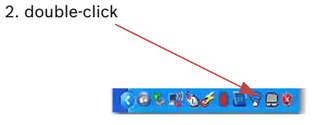
Figure 2-7. PC Ad-Hoc Wireless

Now that your VCI is properly configured for ad-hoc communication, you will need to create a peer-to-peer network with your computer using the wireless USB adapter.

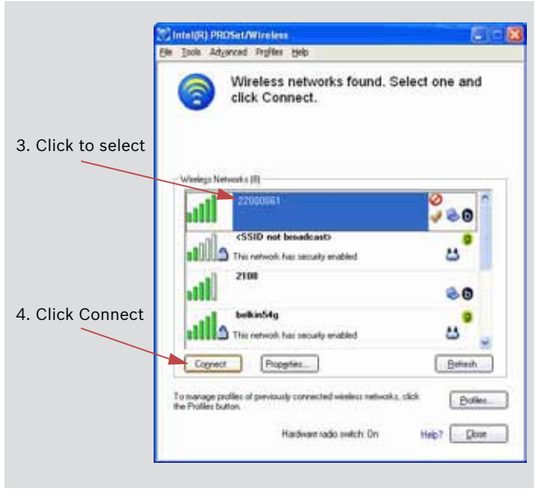
1. From the Windows Task Bar, find and double-click the wireless icon and ensure that Wireless LAN is ON and enabled.



2. Next, also from the Windows Task Bar, find and double-click the wireless icon.



3. The wireless dialog will open, displaying a list of all wireless networks found in your area. These are SSIDs (Service Set Identifiers) used to identify the different available networks. Don’t worry about the technical aspects of this. You just need to find and click the one for your VCI. To make it easy, the correct SSID is identified in the dialog box by the serial number of your VCI.



4. Click the Connect button

5. A message appears at the top of the dialog telling you that you are now joined to the ad-hoc network you have created. The yellow network icon on the task bar should now turn green, further indicating that you have a live connection.

6. Close wireless dialog by clicking its Close button.

7. If you still have the Mastertech VCI Setup dialog open, click the Refresh button.

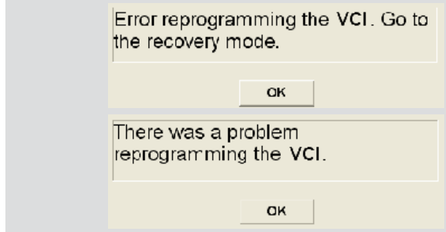
8. The dialog updates to show the wireless IP Address for your VCI.

Your wireless ad-hoc network is now be ready to use.

Recover VCI Tester Software

As a result of a power failure or a communications error during a software update, the VCI Tester Software may become corrupted. You may see several symptoms such as error messages directing you to go to RECOVERY mode or an inability to connect to a detected VCI.

The two error messages below would generally occur during VCI Tester Software download. If you see either of these messages, perform the Recovery Procedure.



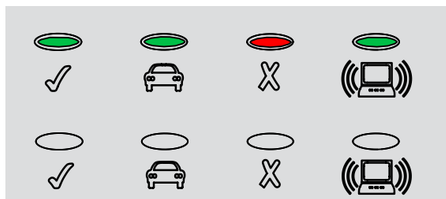
Recovery Procedure

Connect your VCI to the PC using the USB cable.

The following procedure will place the VCI in a RECOVER state.

1. Remove power from the VCI. This may require disconnecting the power cord and pressing the Power button. Ensure that all the LEDs are off. If the VCI Power button does not shut off the power after the power cord is removed, remove the batteries. Refer to Replacing the Batteries.

2. Press and hold the Power button down while you apply power to the VCI. When you see all the LEDs light as shown at the right (about 10 seconds), release the Power button. The VCI will start up in a recovery state with only the Power On LED lit. Continue with the next step.



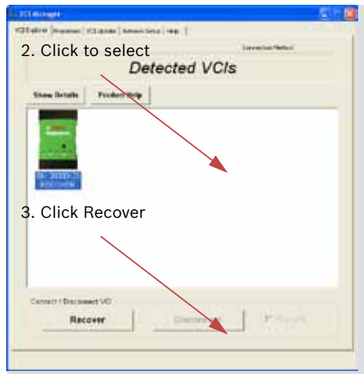
1. Start the VCI Manager application, refer to Starting the VCI Manager application.

Note
Your VCI must be connected via USB or it will not be recognized.

2. Select the VCI displaying the serial number matching your VCI.

3. Click Recover.
The VCI Manager application switches automatically to the VCI Update tab.

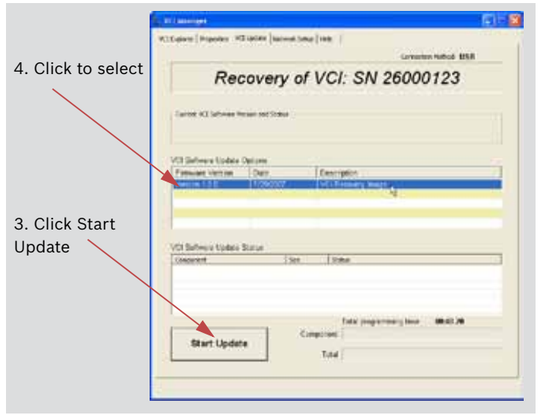
Note
The recovery process could take up to 30 minutes.



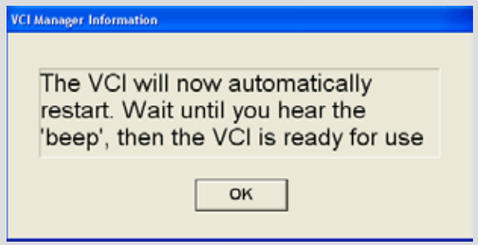
Note
The recovery procedure will clear the VCI network settings.

4. Select the latest version of the VCI Recovery Image.

5. Click Start Update.
Do not unplug the VCI from the PC or remove power from the VCI during the recovery process.



6. When you see the message shown at the right, click OK.
The VCI Manager application switches automatically to the VCI Explorer tab and your VCI will appear when it has finished the restart and Power On Self Test (POST).

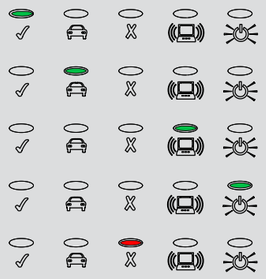

VCI Manager Information
The VCI will now automatically restart. Wait until you hear the 'beep', then the VCI is ready for use
OK

Note
After recovering the software, the VCI takes a few minutes to reboot the first time.

Power On Self Test

Turn on the VCI by connecting to power (A/C 12-V adapter or vehicle's DLC port).

When you first apply power to the VCI, the Power On Self Test (POST) will run. You should observe the following sequence of lights and hear the "BEEP' indicating that the VCI is working properly.



Quick flash

1st stage

2nd stage

3rd stage, then "beep"

Error detected

Connecting the VCI to the Vehicle

The Mastertech Vehicle Communication Interface kit contains the following cable to connect the VCI to the vehicle.

J1962 16/26 pin Data Link Connector (DLC) cable

Refer to the Repair Manual or the electrical wiring diagram for the vehicle you are testing to determine the location and type of Data Link Connector (DLC) installed on the vehicle.

1. Connect the 26-pin end of the DLC cable to the bottom of the VCI, then tighten the screws.

2. Connect the 16-pin end of the DLC cable to the vehicle DLC connector.

Powering the Mastertech Vehicle Communication Interface

The VCI can be powered by the vehicle's 12-volt battery or by the 120VAC/12VDC, 1A Power Supply. The internal AAA batteries provide power only for short intermittent power outages.

120VAC/12VDC, 1A Power Supply

Connect the 120VAC/12VDC, 1A Power Supply to the bottom of the VCI, then plug the power supply into a standard wall outlet.

Vehicle Battery

The VCI is powered directly by the DLC cable when the cable is connected to the vehicle DLC.

Finishing Up

After using the Mastertech Vehicle Communication Interface (VCI), a few simple steps will help you leave the vehicle electronic system(s) in the proper state and also ensure that you get the most use out of your diagnostic tools:

1. Reconnect all hoses, connectors, spark plug wires, fuel lines, etc. that were disconnected from the vehicle during testing.
2. Before turning the VCI off, exit Shop Foreman Pro software.
3. Turn the VCI off by pressing the on/off button. The LED turns off.
4. Disconnect the VCI's J1962 16/26 Pin DLC cable from the vehicle.
5. Disconnect the USB or ethernet cable from the PC and the VCI.
6. Inspect the cables and connectors for damage and corrosion. Replace faulty components immediately.
7. Store the VCI, cables, and other parts in a secure, dry location.

Cleaning and Storing Your VCI

If the VCI, connectors, or cables become dirty, they may be cleaned by wiping them with a rag lightly coated with a mild detergent or non-abrasive hand soap. Do not immerse the VCI or any of its parts or accessories in water. Avoid using harsh solvents such as petroleum based cleaning agents, Acetone, Benzene, Trichloroethylene, etc. Although the VCI and accessories are water resistant, they are not waterproof; thoroughly dry them prior to storage.

Battery Replacement

Note
Know the Law! Dispose of batteries legally!

Batteries are considered hazardous waste under many local laws or regulations and may not be discarded in the municipal waste system. Check with local solid waste officials in your area for recycling options or proper disposal methods. Many local government agencies and businesses run programs that help businesses properly dispose of hazardous wastes.

Replacing the Batteries

The VCI contains four AAA batteries. The batteries are not intended to power the VCI. The batteries only provide back-up power for momentary power interruptions like those that can occur during engine cranking.

The batteries will supply power to keep the VCI running for about 30 seconds before shutting it down.

To replace the batteries:

1. Install new batteries with the positive (+) and negative (-) terminals oriented as indicated on the inside of the battery enclosure.
2. Place the cover on the battery case so the tabs at the top of the cover are aligned with the slots in the case, and the slots at the bottom of the cover are aligned with the tabs on the case.
3. Press the arrow on the battery cover while pushing the cover toward the top of the case. The cover should snap into place.

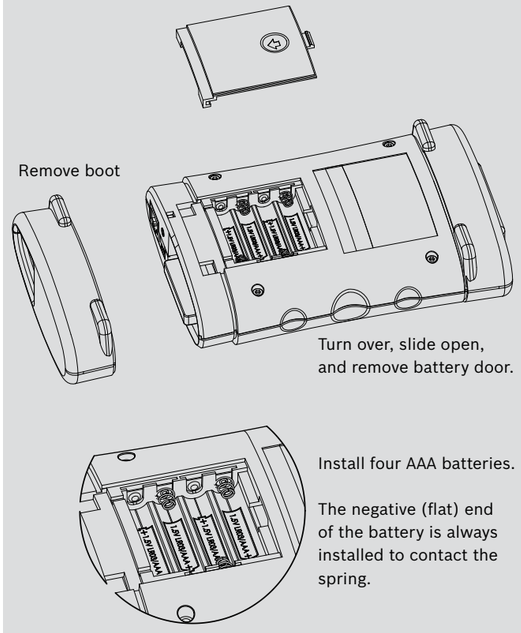

Remove boot
Turn over, slide open, and remove battery door.
Install four AAA batteries.
The negative (flat) end of the battery is always installed to contact the spring.

Figure 1. Install the Mastertech Vehicle Communication Interface Batteries

Notes

Notes

Term	Definition
802.11 B/G	TCP/IP standard for transmitting and receiving wireless communications.
AC	Alternating Current
Access point	A device that connects wireless communication devices together to create a wireless network.
Ad-hoc mode	A direct connection between the Mastertech VCI and the PC without a network.
BAUD RATE	The speed at which data is transferred over a serial data link.
bps	Bits per second. Unit used for baud rate.
Cable keeper	Rubber grommet used to keep the USB cable connected to the VCI.
Cross-over ethernet cable	Twisted pair ethernet cable with wires connected differently at one of its ends.
CURSOR	Highlighted text or data on a display screen. Same as Marker.
DC	Direct Current
DCE	Data Communication Equipment. A term used to describe a device connected to an RS232 link.
DHCP	Dynamic Host Communication Protocol used for assigning IP addresses.
Direct Connect	Communication connection directly between a VCI and a PC. The connection can be either wireless (Ad-Hoc) or wired (cross-over ethernet cable).
DLC	Data Link Connector
DTE	Data Terminal Equipment. A term used to describe a device connected to an RS232 link.
ECM	Engine Control Module
ECU	Electronic Control Unit
EEPROM	Electronically Erasable PROM
Ethernet	Standardized IEEE 802.3 twisted-pair wire for connecting systems to a network is the most widespread wired LAN technology.
Firewall	Software that prevents forbidden communications from entering your network.
Host ID	Alphanumeric sequence used to license Shop Foreman Pro software.
Hz	Hertz, a unit of measure for frequency.
I/F	Interface
I/O	Input/Output
I/P	Instrumentation Port
IP address	Internet Protocol address. A numeric code that allows computers to communicate with each other.
Infrastructure mode	A wireless connection between the Mastertech VCI and the PC via a network.
LAN	Local Area Network,
LED	Light Emitting Diode
OBD	On Board Diagnostics
PC	Personal Computer running the Microsoft Windows 2000 or XP Pro operating system.
POST	Power On Self Test
RCV	Receive
Recovery mode	A process which allows the VCI to power up in a stored known good version.
Router	A network device that manages communications between PCs, and assigns IP addresses to other network devices.
RS232	Same as RS232C.

Term	Definition
RS232C	The most standard serial communication interface used in the computer industry.
SCI	Serial Communication Interface
Shop Foreman Pro	PC application used to view and store data from Bosch diagnostic tools.
SSID	Service Set Identification. This is the name of the network you set up to allow your PC to communicate with the Mastertech VCI. Each packet is identified as part of a network by the contained SSID.
TCP/IP	Internet communications protocol
TKIP	Temporal Key Integrity Protocol
USB	Universal Serial Bus. Technology that allows devices such as the VCI to be connected to a PC without having to restart the PC.
VCI	Mastertech Vehicle Communication Interface
VCI Manager application	PC software that configures, tests, and updates the VCI.

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